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NO. 13026

STAMPED AND WELDED TRACK FOR
15 - 18 TON VEHICLE

CONTRACT DAAE07-81-C-4090

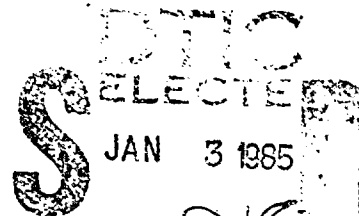
JUNE 1984



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84 12 19 081

REPORT DOCUMENTATION PAGE

1a. REPORT SECURITY CLASSIFICATION Unclassified			1b. RESTRICTIVE MARKINGS None		
2a. SECURITY CLASSIFICATION AUTHORITY			3. DISTRIBUTION / AVAILABILITY OF REPORT Approved for Public Release		
2b. DECLASSIFICATION / DOWNGRADING SCHEDULE					
4. PERFORMING ORGANIZATION REPORT NUMBER(S) 4702			5. MONITORING ORGANIZATION REPORT NUMBER(S) 13026		
6a. NAME OF PERFORMING ORGANIZATION Standard Products Company		6b. OFFICE SYMBOL (If applicable) 98761	7a. NAME OF MONITORING ORGANIZATION TACOM / DRSTA-RCKT		
6c. ADDRESS (City, State, and ZIP Code) Port Clinton, Ohio 43452			7b. ADDRESS (City, State, and ZIP Code) Warren, Michigan 48090		
8a. NAME OF FUNDING / SPONSORING ORGANIZATION Combat Systems Div.		8b. OFFICE SYMBOL (If applicable) AMSTA - RC	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER DAAE07-81-C-4090		
8c. ADDRESS (City, State, and ZIP Code) TACOM Warren, Michigan 48090			10. SOURCE OF FUNDING NUMBERS		
	PROGRAM ELEMENT NO.	PROJECT NO.	TASK NO.	WORK UNIT ACCESSION NO.	
11. TITLE (Include Security Classification) Stamped and Welded Track for T5-18 Ton Vehicle - Unclassified					
12. PERSONAL AUTHOR(S) A.B. Kendall					
13a. TYPE OF REPORT Final		13b. TIME COVERED FROM Sept. 1981 to Dec. 1983		14. DATE OF REPORT (Year, Month, Day) June - 1984	
15. PAGE COUNT 16					
16. SUPPLEMENTARY NOTATION					
17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)		
FIELD	GROUP	SUB-GROUP	Weld Clamp Type		
			Formed		
19. ABSTRACT (Continue on reverse if necessary and identify by block number)					
<p>This program was initiated to further the development of the T150 track. The aim is to develop a light weight track shoe and end connector by stamping parts from steel plate, forming, and welding. The ability to fabricate track by this method, equal to the forged track normally used, would broaden the manufacturing base available to produce in case of national emergency. The track is presently being tested at the Nevada Automotive Test Center.</p>					
20. DISTRIBUTION / AVAILABILITY OF ABSTRACT <input checked="" type="checkbox"/> UNCLASSIFIED/UNLIMITED <input type="checkbox"/> SAME AS RPT. <input type="checkbox"/> DTIC USERS			21. ABSTRACT SECURITY CLASSIFICATION Unclassified		
22a. NAME OF RESPONSIBLE INDIVIDUAL Joe Fix			22b. TELEPHONE (Include Area Code) 313-574-8681		22c. OFFICE SYMBOL DRSTA-RCKT

PREFACE

The author wishes to thank the following people for their aid in the successful completion of this task.

Ed Gow, Chief, Track and Suspension group, TACOM, now retired.

Joe Fix, Project Engineer, TACOM.

George Nichols, Military Coordinator at Standard Products Company, now retired.

Bill Pringle of William Pringle and Associates.



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1.0. INTRODUCTION

This final technical report, prepared by The Standard Products Company for the U. S. Army Tank-Automotive Command under Contract DAAE07-81-C-4090, describes the design and development of XT150 track by the use of steel sheet and bar; stamped, formed to shape, and welded. This method of manufacture avoids completely the use of forging or casting facilities that would be in short supply in the event of a national emergency. The end connectors for this track were of the clamp type (See Fig. 1-1) with both machined and stamped steel connector pins used for assembly.

2.0. OBJECTIVE

The intent of this program is to produce tank track of the latest design using general stamping and welding methods and maintaining the same or less weight than the forged track. → Form 1473

3.0. CONCLUSIONS

Further improvements are necessary to make the stamped, welded shoe and stamped, welded end connector a suitable replacement for the forged and cast parts presently used on the XT150 track.

4.0. RECOMMENDATIONS

4.1. Shoes

Design of the welded shoes should be extended to attempt reducing the weight to near that of the T130 track.

4.2. Connectors

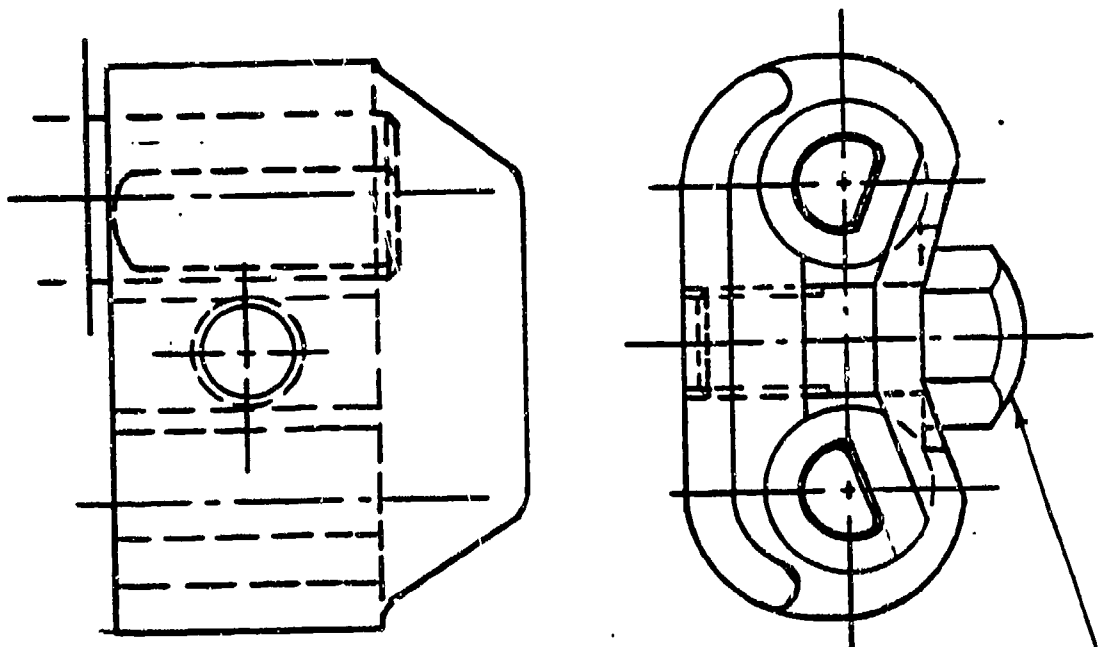
The welded clamp type end connector should have more work to develop the optimum steel and heat treat combination. The design should be altered to allow greater clearances in the non-clamp area when the end connector bolt is torqued to the limit.

4.3. Connector Pins

The connector pins that have a machined O.D. and I.D. with the clamp flats stamped in place have been successful. Additional development work should be accomplished to create these pins from standard purchased tubing to eliminate machining costs.

4.4. Corrosion

The use of welded steel plates to form shoes and connectors has resulted in entrapment areas for water and mud. Extended testing should be performed to relate these effects to the life of the track.



3/4 N.F. Grade 8 Bolt
with Hardened Head
Torque 350-400 Ft.-#'s.

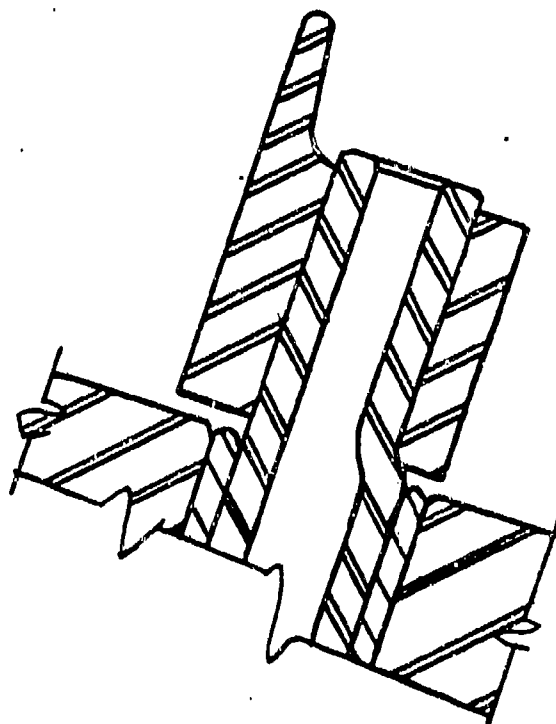


Fig. 5-1. Forged clamp type end connector mounted on pins with flat stamped in place.

5.0. DISCUSSION

5.1. Background

In September of 1978, Contract DAAK30-78-C-0062 was let to design and develop a double pin style track for the 15-18 ton vehicle range. The result of this contract was a 15 inch track using cast shoes and cast end connectors. This was labeled the "XT150". Contract DAAK30-79-C-0140 was let in September of 1979, to further develop the XT150 track concept. The final design was a double pin track with forged or cast track shoes and with forged end connectors. One very promising concept that was tentatively explored under Contract DAAK30-79-C-0140 was the clamp type end connector. These were used with connector pins that had been impact formed to shape rather than machined.

The present contract, being discussed here, is intended to further develop this track by stamping and forming the shoe and end connector parts from standard sheet and bar stock. These parts are welded to form the shoes and end connectors. The end connectors used were of the clamp type previously tested but were formed by the stamping and welding process. Half of the end connectors used were forged clamp type to provide a standard to compare to.

5.2. Design

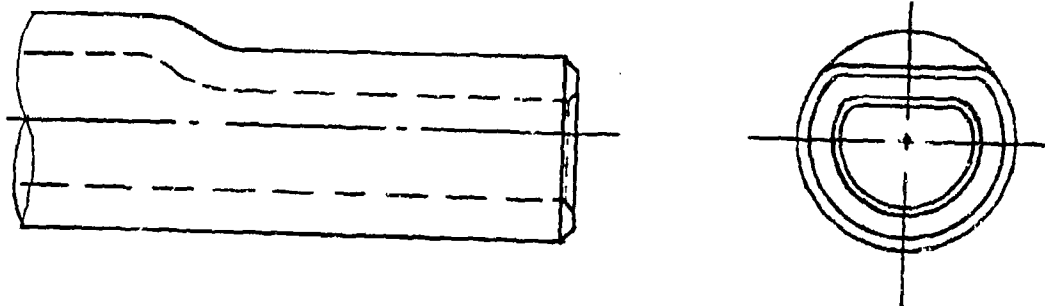
The stamped, formed and welded version of the XT150 track was designed by William L. Pringle and Associates of Detroit, Michigan for The Standard Products Company. The stamped, welded shoes and connectors were also fabricated by The William L. Pringle Company. The shape and physical line of the existing XT150 track design were maintained in the stamped version so that pin and sprocket fit would not be affected. End connectors were of the clamp type and were made as a stamped and welded assembly and also as a forged part, per Standard Products Company drawing XP-1749-1, (see illustration 5-3 and 5-4, pages 10 and 11). Connector pins were made as a drilled tube with the flats stamped in place, per Standard Products Co. (XP1749-2), also as a drilled tube with the flats machined in place, (see illustration 5-2, page 9). The parts were assembled into one 63 pitch track with spares and sent to Nevada Automotive Test Center for evaluation.

5.3. Fabrication

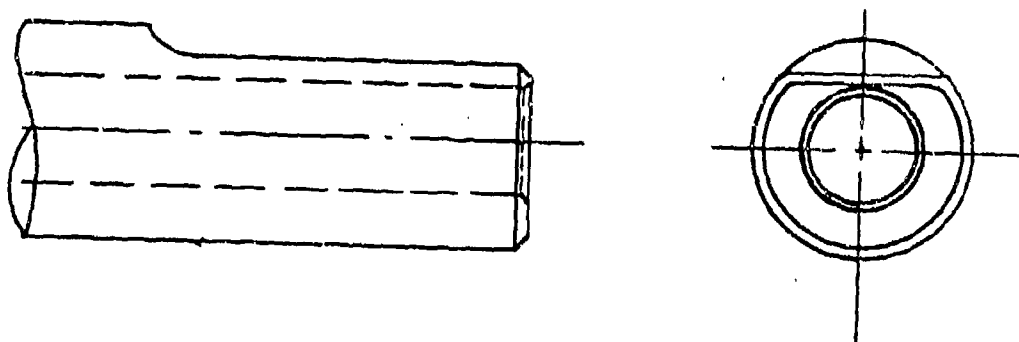
The stamped track molded and assembled about as well as the regular XT150 track. Assembly was done with the shoe pitches in a vertical position in order to get at the end connector bolts for torquing. There was some breaking of the stamped and welded end connectors when assembly was started. The end connectors were checked and found to be too hard. The end connectors were reheat treated and then assembled to the track.

6.0. TESTING

The completed track was sent to Nevada Automotive Test Center for field evaluation. It is presently being tested in conjunction with special track fabricated under Amend 0003 of Contract DAAK30-79-C-0140. Test results are not yet available.



Connector pin with flats stamped in place.



Connector pin with flats machined in place.

Fig. 5-2. Comparison of clamp type end connector pins, stamped flats and flats machined in place.

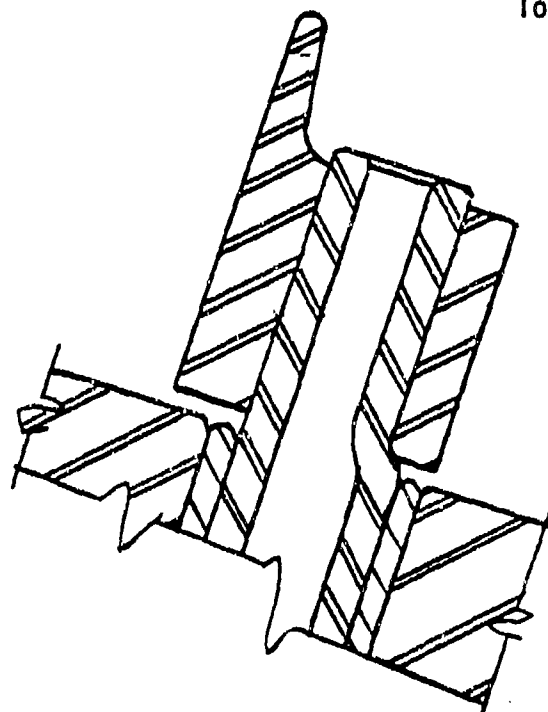
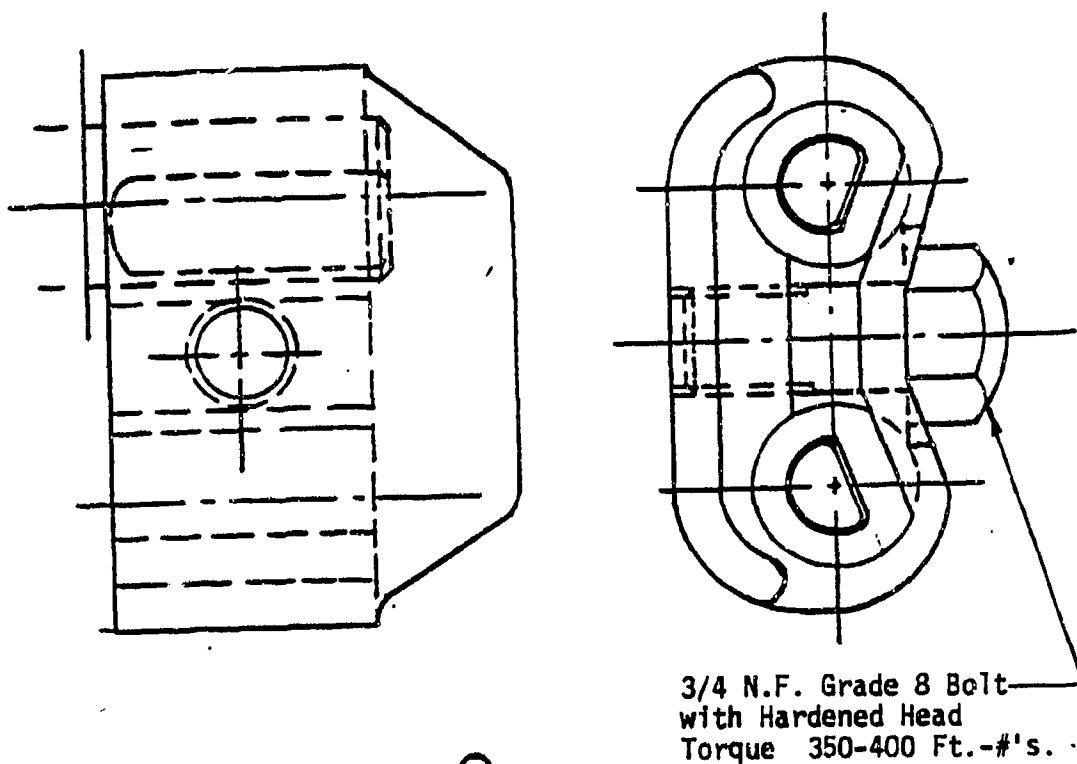
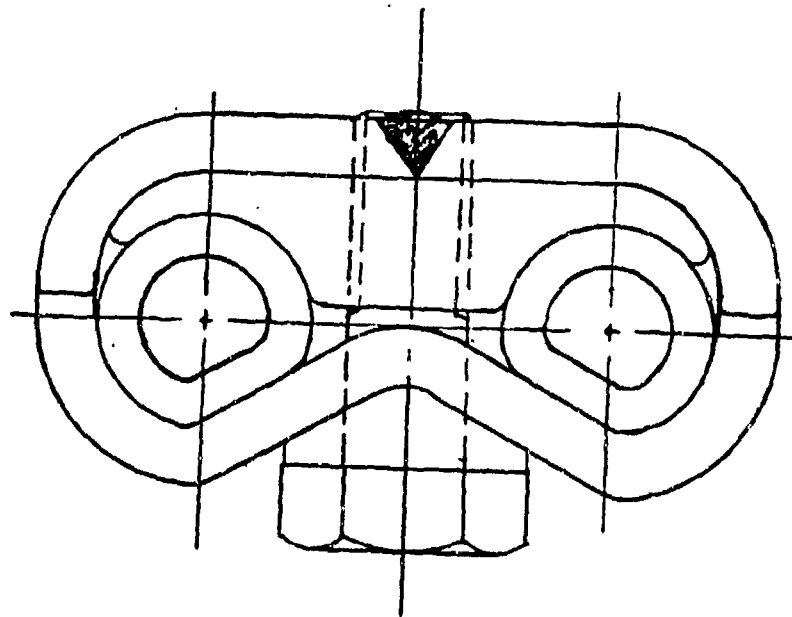


Fig. 5-3. Clamp type end connector with pin flats stamped to size.



3/4" N. F. bolt shown. Should use
3/4" N. F. bolt with hardened dome head.

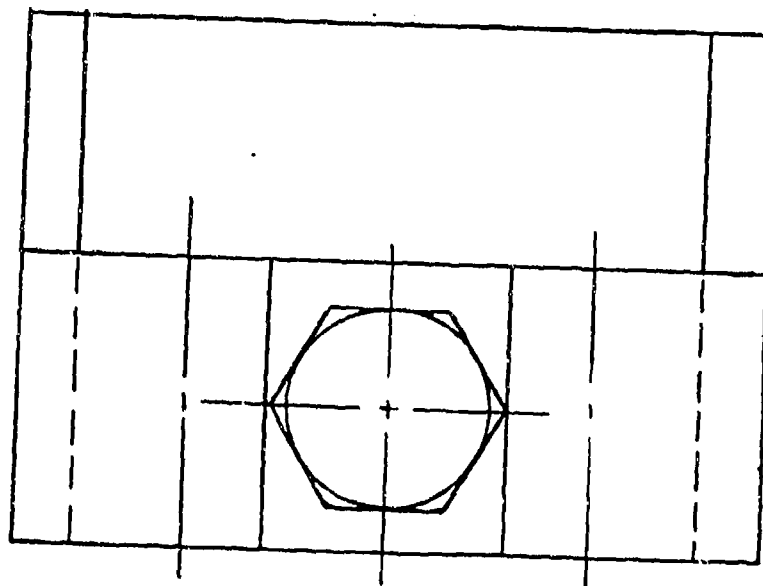
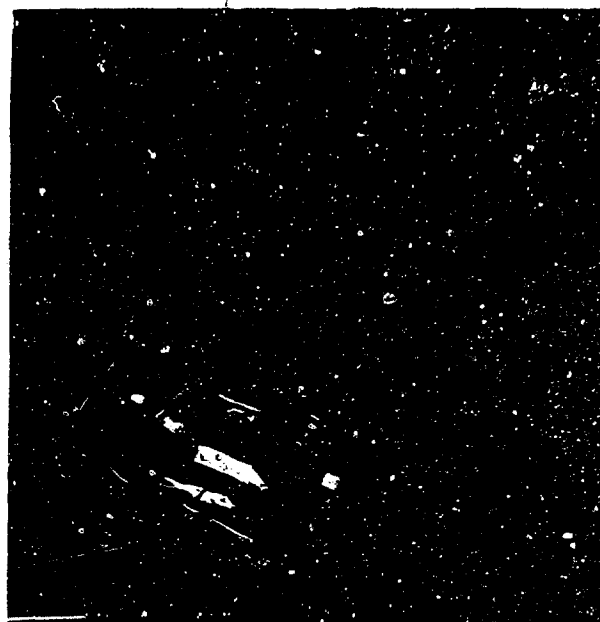
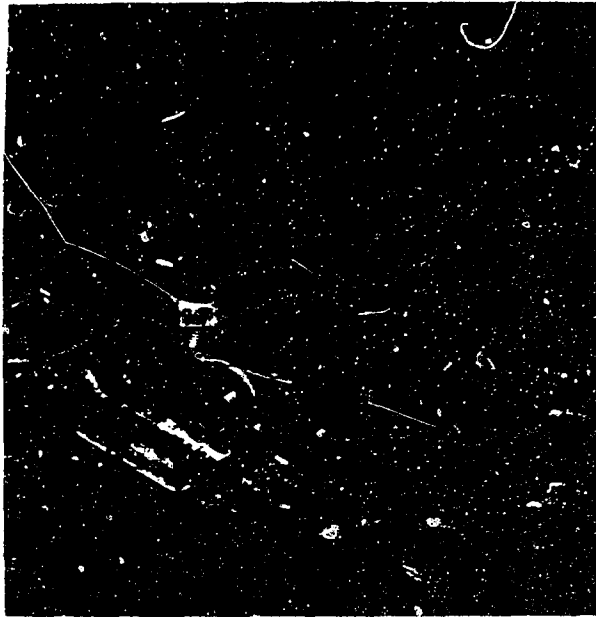


Fig. 5-4. Clamp type end connector of stamped and welded steel construction.



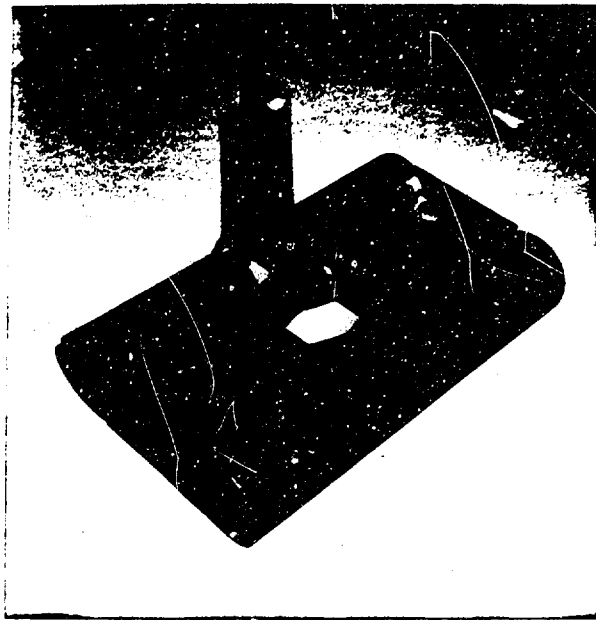
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Fig. 5-5. Stamped and welded. Clamp type end connector showing stamped connector pin in position.



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Fig. 5-6. Forged clamp type end connector showing stamped connector pin in position.



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Fig. 547. T-150 shoe welded of stamped parts and tubing cut to length.

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